WATCHING THE WEATHER WITH UNCLE SAM.

The second of a series of ten talks by Welby R. Stevens, assistant forecaster, U. S. Weather Bureau, delivered through WRC and 32 other stations associated with the National Broadcasting Company, at 1:10 p.m., Eastern Standard Time, Thursday, January 2, 1930.

***

This summary gives you a picture of weather conditions in the United States today. Now we shall continue the series of talks which was begun last Monday and tell you how the observations are made upon which this and other summaries are based.

In preparing his summaries and predictions the forecaster depends upon simultaneous observations of local weather conditions at about 250 regular observing stations in the United States, Canada, Alaska, and the West Indies. The stations are all manned by trained observers and meteorologists. The observations are made twice daily, at 8 a. m. and 8 p. m., 75th meridian time, which corresponds to 7 o'clock in the Central Valleys, 6 in the Rocky Mountains, and 5 on the Pacific coast. When occasion demands, as for instance, when a hurricane is approaching the coast, or a severe cold wave is spreading southward and eastward over the country, the forecaster calls for special observations to be made at intermediate hours at selected stations in the danger zone.

Nearly all the observations are made by means of instruments which have been devised or improved by the Instrument Division of the Weather Bureau.

One of the most important meteorological instruments is the barometer. It measures the atmospheric pressure, which is simply the weight of the column of air above the station to the outer limits of the atmosphere. Although we are absolutely unconscious of the ordinary changes in atmospheric pressure, it is subject to considerable variation. Since pressure decreases with altitude it is necessary to reduce the readings at the various stations to a comparable basis, namely, sea level. The temperature is measured by means of a thermometer, with which everyone is familiar. In addition to the ordinary thermometer the observer uses maximum and minimum thermometers, which record the highest and lowest temperatures since the last observation.

The amount of moisture in the air is determined from the readings of the ordinary thermometer and the wet bulb thermometer.

The wind direction and velocity are obtained from the wind vane and anemometer. These instruments are connected electrically to a register in the office which keeps a continuous record of the direction and velocity of the wind.

About 50 stations determine the direction and velocity of the wind at certain fixed levels above the surface. These observations are made by means of small rubber balloons inflated with hydrogen so that they ascend at a rate of 180 meters or about 500 feet per minute. Since the altitude of the balloon is known at certain specified intervals during ascent, its direction and distance from the point of observation may be determined by angular measurement. When these factors are known the velocity and direction

(over)

of the wind at any level can be computed. In order to obtain the angular readings the theodolite, an instrument similar to the surveyors transit is used.

The rain gage measures the amount of precipitation that has fallen since the last observation 12 hours before. This instrument is also connected to register in the office which records each one hundredth of an inch of rain that falls.

Cloud observations are made without the aid of instruments. The observer records the amount, kind and direction according to an international standard of classification.

The next chapter in this story will be given next Monday when we will tell you how the observations are assembled.